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ABSTRACT

Recent trends toward earlier retirement have exacerbated the financial problems facing the Social Security system and many other public and private pension plans. The massive commitment of public and private funds to Social Security and pension funds is partly responsible for the trend to early retirement. This, in fact, was one of the early goals of Social Security: to induce older workers out of the weak labor markets of the 1930's. Now, however, the age distribution has changed and the population of retirees has risen. There are three general approaches to bolstering the Social Security System: (1) an increase in employee contributions; (2) a decrease in the schedule of benefits, or delay of eligibility; and (3) an alteration in public policy to induce later retirement. The benefit structure of Social Security and pension plans often provides strong financial incentives to retire precisely at the mandatory age: the carrot and stick are frequently applied simultaneously. To observe actual labor force transition behavior, adults employed in 1973 who did not face mandatory retirement by 1975 were studied. Results showed that health, full-time earnings, and whether or not retirement income would be lost by working, were significant variables. Research suggests that the extension of the mandatory retirement age will not greatly affect work effort of older persons. A public policy that hopes to alter individual retirement decisions should focus on the financial incentives at the heart of retirement plans. (JAC)

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Retirement Trends and Public Policy: The Carrot and The Stick

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ABSTRACT

Recent trends toward earlier retirement have exacerbated the financial problems facing the Social Security system and many other public and private pension plans. One of the few federal initiatives to reverse this trend has been to outlaw mandatory retirement before age 70 for most American workers. We argue that this legislation by itself will have little effect on retirement patterns because of strong financial incentives to retire that remain imbedded in the retirement system. We discuss the nature and magnitude of these incentives, and present evidence that workers understand and respond to them. We conclude that a public policy that hopes to alter individual retirement decisions should focus on the financial incentives at the heart of retirement plans rather than on the frequently redundant mandatory retirement constraint.

I. RETIREMENT TRENDS

Four decades of nearly unanimous support of government retirement policy and the institutions it has spawned was shaken at the beginning of this decade by a growing concern over their financial viability. Since 1979, four separate blue ribbon commissions have addressed these issues, and have generated different and often contradictory proposals. The most recent of these groups, The National Commission on Social Security Reform, is currently deliberating on its final recommendations.

There is no question that the massive commitment of public and private funds to Social Security and private pensions and the rules under which they have been distributed are partly responsible for one of the most dramatic demographic changes of the past 30 years--the trend toward earlier and earlier retirement among American workers. Table 1 documents labor force participation rates by year, age and sex. A horizontal view during any given year shows the dramatic decrease in work effort at older ages. In 1980, for example, 85 percent of men age 55 were in the labor force, compared to 35 percent of those 65 and only 21 percent of those 70. While the reduction in work effort by age category can be observed back to 1950, the magnitude of the decrease has become much more precipitous, especially for those over 60. In 1950, for example, the participation rate of men aged 60 was very close to that of 63 year olds. It was only 13 points higher than for men aged 65 and 35

Table 1: Labor Force Participation Rates of Older Men and Women, 1950 to 1980

	AGE					
	55	60	63	65	68	70
YEAR	MEN					
1950	90.7[a]	84.7[a]	79.8[a]	71.7[a]	57.7[a]	50.0[a]
1960	92.8[a]	85.9[a]	77.8[a]	56.8[a]	42.0[a]	37.3[a]
1968	91.9	84.8	71.9	53.4	37.5	30.2
1970	91.8	83.9	69.4	49.9	37.7	30.2
1972	90.7	82.1	66.5	45.2	33.8	27.1
1974	88.1	79.0	59.3	39.8	27.7	23.5
1976	87.1	75.5	55.7	36.6	26.7	22.4
1978	85.8	74.4	52.2	36.3	28.7	21.7
1980	84.9	74.0	52.3	35.2	24.1	21.3
	WOMEN					
1950	27.9[a]	23.1[a]	19.1[a]	16.3[a]	11.4[a]	8.1[a]
1960	42.5[a]	34.7[a]	26.1[a]	20.3[a]	14.6[a]	11.7[a]
1968	50.4	43.5	30.3	21.0	14.3	10.7
1970	52.6	44.0	31.9	22.1	15.0	12.2
1972	50.7	43.2	30.8	21.6	15.4	9.5
1974	50.9	40.8	26.0	18.9	12.0	9.0
1976	50.2	41.6	27.2	19.1	12.6	8.8
1978	53.1	42.0	28.4	19.5	12.6	9.5
1980	53.8	41.3	28.4	20.8	14.5	9.0

SOURCE: Current Population Survey

[a]Based on U.S. Bureau of the Census labor force participation data.

points above those aged 70. In 1980, on the other hand, the work effort of men aged 60 exceeded that of 63, 65, and 70 year olds by 22, 39, and 53 points, respectively.

If "normal" retirement age is defined as the age at which a majority of workers are out of the labor force, then a vertical look at Table 1 reveals the change in this age over time. In 1950, it was not until age 70 that the work effort of U.S. males fell to 50 percent; over 7 men in 10 worked at age 65 as did 8 in 10 at age 63. By 1970, the "normal" retirement age for males had fallen to 65; and only 3 men in 10 continued to work at age 70. In 1980, "normal retirement" age was down to 63; only 1 in 3 men was still working at 65, and 1 in 5 at 70.

A similar pattern has emerged among women--only more recently. From 1950 to 1960, participation rates of women increased at all the ages shown in Table 1. From 1960 to 1970, these increases continued, but at slower rates. After 1970, however, work effort began to decrease for women age 60 and over, despite continued increases in participation for women in general.

A by-product of these trends has been a dramatic convergence in the participation rates of older men and women. In 1950, a 55 year old man was over 3 times more likely to be working than a woman the same age. By 1980, this ratio was down to 1.6. For men and women aged 65, the comparable ratio dropped from 4.4 to 1.7, and for 70 year olds, from 6.2 to 2.4. For the 55 and 60 year olds, this convergence

is due to moderate decreases in the work efforts of men combined with substantial increases for women. At the older ages, the driving force was the dramatic decreases in the participation rates of men.

Until recently, there was no particular alarm over the trend toward earlier retirement. If anything, it was applauded. In fact, this was one of the goals of the architects of the Social Security system--to induce older workers out of the extremely weak labor markets of the late 1930s. Although that explicit goal faded in importance as the economy strengthened during the decades that followed, the trend toward earlier retirement was seen as logical in an increasingly wealthy society. Some of this wealth was "spent" on leisure, and some of this leisure was enjoyed in the form of earlier retirement.

This trend, however, is no longer viewed as benign for at least two reasons. The first is the financial crisis facing the Social Security system as well as other public sector and many private retirement programs. The Social Security trust fund, abandoned as a full-funding asset base in the first decade of the program, is now almost empty. Current Social Security revenues are paid directly to current recipients, with hardly any buffer remaining to handle shortfalls. Much of this problem is short run (if a decade of recession can be called short run). It is due largely to the decrease in Social Security tax revenues during the recession, and to the accidental over-indexing of

benefits in an attempt to offset inflation, rather than to an unexpected flood of new recipients. Nonetheless, the problem has called public attention to Social Security funding issues--something traditionally left to actuaries and special presidential panels.

The second reason for concern is anything but short run. The age distribution in America is changing, and the proportion of the population aged 65 and over will continue to rise through the first quarter of the 21st century. Using three different sets of assumptions concerning fertility and immigration, the Census Department projects that the proportion of the population aged 65 and over will rise from under 11 percent currently to between 17 and 20 percent by 2025 (see Clark [1980]). The old-age dependency ratio (the ratio of those over 64 to those 18 to 64--a rough index of the retiree to worker ratio) will rise from 18 percent to nearly one-third.[1] This change alone would put a strain on the Social Security system. When it is combined with decreased prospects for real growth and a trend toward earlier retirement, the financial strains multiply.

There are three general approaches to bolstering the finances of the Social Security system. Until now, we have chosen to rely on increased contributions from covered employees. The maximum annual contribution, for example, has risen from $374 in 1970 to $2392 in 1983, and this sum is matched by the employer. Further increases in the tax rate are scheduled through 1986, and the earnings base is

now automatically indexed to rise with the cost of living.

A second tactic would be to decrease the schedule of benefits or to delay the age of eligibility. The Reagan Administration proposed this approach and then beat a hasty retreat in the fact of intense political opposition. In fact, quite the opposite has been occurring--real benefits have risen dramatically in recent years. Table 2 shows the change over time in annual Social Security benefits for the median 65 year old worker, with a 65 year old dependent spouse, who retires on January 1.[2] Between 1959 and 1968, ad hoc increases approved by Congress kept real benefits approximately constant. Between 1968 and 1981, however, real benefits rose nearly 60 percent. Not surprisingly, proposals to take back these real gains are extremely unpopular.

A third approach to the Social Security financing problem is to alter public policy to induce later retirement--to slow or perhaps even reverse the early retirement trend discussed above. Our paper addresses this approach.

II. RETIREMENT DETERMINANTS

A major federal initiative to induce later retirement was a 1977 Amendment to the Age Discrimination in Employment Act which raised from 65 to 70 the age of earliest mandatory retirement for most American workers.[3] Both President Reagan and Representative Claude Pepper (D-Fla.), the chief congressional spokesman for senior citizens, strongly favor

Table 2: Yearly Social Security Benefits for a Worker with Median Earnings Aged 65 with a 65 Year Old Dependent Spouse

Year[a]	Yearly Benefit (current dollars)	Yearly Benefit (1967 dollars)	% Change in Real Terms from Previous Year
1959	1,886	2,160	--
1960	1,903	2,145	-0.7
1961	1,920	2,143	-0.1
1962	1,933	2,134	-0.4
1963	1,951	2,128	-0.3
1964	1,970	2,121	-0.3
1965	2,132	2,256	6.4
1966	2,157	2,219	-1.6
1967	2,186	2,186	-1.5
1968	2,218	2,129	-2.6
1969	2,546	2,319	8.9
1970	2,985	2,567	10.7
1971	3,342	2,755	7.3
1972	3,401	2,714	-1.4
1973	4,157	3,123	15.1
1974	4,238	2,869	-8.1
1975	4,799	2,977	3.8
1976	5,343	3,134	5.3
1977	5,878	3,239	3.4
1978	6,448	3,300	1.9
1979	7,009	3,224	-2.3
1980	7,851	3,179	-1.4
1981	9,136	3,366[a]	5.9
1959-1968			-1.4%
1968-1991			+58.1%

[a]Assumes worker and wife are aged 65 on January 1. Benefits are based on social security rules as of January 1 of each year.

the outright abolition of all mandatory retirement provisions, and many Washington observers predict this will occur in the next several years. Relaxation of mandatory retirement rules clearly increases the options available to many employees by permitting them to remain on their same jobs until age 70 or possibly longer. But whether it will significantly alter retirement trends depends on why workers retire when they do.

The reasons for retirement are many and varied. Some people work until health problems force them out of the labor force: in surveys in which retirees are asked why they left their last job, the most frequent answer is always health. Others retire when they become eligible for retirement benefits: the surge of retirements at age 62--the age of earliest eligibility for Social Security retired workers benefits--is certainly no coincidence. Still other people retire only when they are forced to by company regulations.

Mandatory retirement rules are widespread in the United States. Using data on men and non-married women aged 58 to 61 and employed in 1969, we found that 43 percent faced mandatory retirement on their current job.[4] With 1971 data from the National Longitudinal Survey, Halpern (1978) found 38 percent of the employed men (and 49 percent of male wage earners) facing mandatory retirement.

Although the mere presence of this constraint does not necessarily make it important, simple behavioral comparisons suggest that it may be. One rough approach is to compare

the labor force behavior of workers with and without mandatory retirement over a transition period. Among a group aged 62 to 64 in 1973, over 55 percent of those without mandatory retirement were still working two years later. (See Burkhauser and Quinn [1983a].) Of those facing mandatory retirement during the two years, only 17 percent remained in the labor force. Barker and Clark (1980) perform a similar analysis, without considering when the mandatory retirement went into effect. For white men aged 65, they report a labor force participation rate difference of 12 percent between those who are and are not covered by compulsory retirement provisions. Between 40 and 50 percent of the covered workers retired at their mandatory retirement age. This represents about a fifth of the entire cohort.

If mandatory retirement provisions, which traditionally went into effect at age 65, were an important factor in the retirement decisions of a large number of workers, then their delay or removal may change behavior significantly. Unfortunately, coincidence does not imply causation. As we will argue below, mandatory retirement is closely intertwined with both Social Security and pension plans. The benefit structures of these retirement plans often provide strong financial incentives to retire at precisely the age when it becomes mandatory; the carrot and the stick are frequently applied simultaneously. Since recent policy reform involves delaying or removing only the stick, the impact of the reform depends crucially on the independent importance

of the carrot.

In the sections below, we describe how these financial incentives to retire operate and what impact they have on the retirement decision.

III. PENSIONS, SOCIAL SECURITY AND MANDATORY RETIREMENT

a) Data

Research on retirement issues has blossomed in recent years, largely because of the perceived crisis facing public and private retirement plans. But another important factor, on the supply side, has been the availability of two superb longitudinal data sets concentrating specifically on older Americans. The National Longitudinal Survey followed over 5000 men aged 45 to 59 beginning in 1966. In 1969, the Social Security Administration began the Retirement History Study (RHS) by interviewing over 11,000 men and non-married women aged 58 through 63. (See Irelan [1976].) These respondents were reinterviewed at two-year intervals through 1979. The extensive questionnaires included information on current and past labor force status, compensation, sources of income, assets and debts, health, retirement plans and expectations, family composition, living arrangements and social activities. The Social Security Administration has also appended its entire earnings history for each respondent to his or her RHS file. This permits detailed calculation of potential Social Security benefits under various retirement scenarios.

b) Pensions and Social Security

The RHS data in Table 3 document the fact that pensions and mandatory retirement are very closely connected. Our sample of male RHS respondents aged 62 to 64 in 1973 is disaggregated by mandatory retirement and pension eligibility status. We differentiate between status during the two-year transition period (1973 to 1975) and later, since behavior during these two years is the focus below.

All but 6 percent of those subject to mandatory retirement by 1975 are also eligible to receive a pension from the current employer. Nearly 80 percent of them are eligible during those two years, and the vast majority of those eligible will be able to receive full benefits. Of those subject to mandatory retirement after 1975, only 11 percent will receive no pension income from that job. This contrasts sharply with those not facing mandatory retirement, of whom over half have no employer pension. Though pension eligibility without mandatory retirement is common, the reverse is extremely rare. Those who are forced out are generally released with retirement income from the firm. The data for the much smaller sample of women tell the same story, although the proportions without a mandatory retirement age and without pensions are higher than for men.

The labor force behavior of those in these various categories is interesting (Table 4). As noted above, those facing mandatory retirement by 1975 are much more likely than others to be out of the labor force by then. But the pension effect is also strong. Only 22 percent of those

Table 3: Mandatory Retirement and Pension Eligibility, Men Aged 62 to 64 in 1973.

(horizontal percentage)

Subject to MR	Pension Eligibility From Current Job				
	During the Two Year Period		Later	Never	N
	Full Benefits	Reduced Benefits			
During the Two Year Period	68	9	17	6	173
Later	29	25	35	11	264
Never	14	8	25	53	754

Source: Retirement History Study

Table 4: Labor Force Participation Rates in 1975, Men Aged 62 to 64 and Employed in 1973.

Subject to MR	Pension Eligibility on Current Job: During the Two Year Period — Full Benefits	During the Two Year Period — Reduced Benefits	Later	Never	Total
During the Two Year Period	8	a	33	a	17
Later	34	51	72	65	55
Never	29	44	64	65	58
Total	22	44	63	65	51

Source: Retirement History Study

[a]Fewer than 20 observations.

eligible for full pension benefits by 1975 are still working then, compared to 44 percent of those eligible for reduced benefits, and nearly two-thirds of those not currently eligible. The combination of mandatory retirement and full pension eligibility is extremely strong, and over 90 percent of workers in this category left the labor force between 1973 and 1975.

The link between Social Security and mandatory retirement is also close. The modal age for mandatory retirement prior to the 1977 Amendments was 65, precisely the age at which most workers become eligible for full Social Security benefits. As we will see below, 65 is also the age at which an important change in the benefit calculation formula takes place.

The impacts of mandatory retirement and Social Security and pension plans frequently occur simultaneously. If they are all important, a simple cross-tabulation using only one of them will overstate its influence. The distribution of influence is extremely important, since recent public policy has tinkered with one (mandatory retirement) but not the other. Disentangling the effects of these three determinants (and others, such as health) requires an understanding of financial incentives to retire and a model and multivariate analysis of their effects.

IV. RETIREMENT INCENTIVES

Both Social Security and pensions are promises of future income streams. Summarizing the magnitude of such a

promise by the size of the initial annual benefit can be deceptive for a number of reasons. It ignores the age of eligibility (when the benefits start), inflation protection after retirement (whether the benefits are fixed in real or money terms) and how the benefit level changes depending on current labor supply behavior. A far superior summary statistic is the asset or wealth equivalent of the pension right--the present discounted value of the future income stream.

Formally, we define

$$(1) \qquad W(s) = \sum_{i=0}^{n} \frac{P_i \, B_i(s)}{(1+r)^i} \text{ , where}$$

W is the wealth equivalent of the income stream,

s is the time period in which benefits are first claimed,

P_i is the probability of surviving the i^{th} period,

$B_i(s)$ is the benefit stream associated with initial acceptance in year s, and

r is the discount rate.

Age of eligibility is part of the calculation, since $B_i(s) = 0$ prior to eligibility. The closer the age of first receipt, the fewer the number of zeros, and the higher the wealth. Inflation protection after retirement is included via the discount rate, which has two components: the real rate of return plus the uncovered portion of inflation. For unindexed plans (like many private employer pensions) the expected rate of inflation is included in the discount rate,

lowering the present value of future nominal benefits, and lowering the asset value of the promise. For fully indexed plans (like Social Security and federal employee benefits) only the real rate is included.

There are two main effects of retirement income eligibility on behavior. The first is a straightforward wealth effect. Pension and Social Security rights are assets, and like any other asset, they enable one to purchase more leisure (i.e., retire earlier). Ceteris paribus, we expect those who are eligible for benefits to retire earlier than those who are not.[5] Research has shown that pension and Social Security wealth are very important components in the wealth portfolios of older workers; for many they dominate all other forms of wealth, including the home. (See Quinn [1982].)

The second effect of Social Security and pensions on retirement behavior is more subtle. It deals with the timing of retirement income acceptance. The wealth value of most pensions depends on when benefits are first claimed (s in equation (1)). When receipt is delayed by an additional year of work, two things happen to retirement income wealth. First, a year of benefits is lost.[6] But second, future annual benefits are usually made higher. They are made higher because of benefit calculation rules and sometimes because of actuarial adjustments, as discussed below. Whether one's wealth increases or decreases depends upon whether the (discounted) gains from higher future annual

benefits offset the current benefits foregone. Prior to eligibility, there are no benefits foregone, so the asset value of the rights can only rise with additional work. But after eligibility, both effects occur, and it is an empirical question as to which dominates.

Social Security benefits are a function of average taxable earnings. Because general wage levels and the taxable earnings ceiling have been rising over time, average earnings and therefore monthly benefits rise with continued work. In addition, workers delaying the receipt of Social Security benefits past age 62 receive an actuarial adjustment to compensate for the lost benefits. Between 62 and 65, this adjustment is about 7 percent per year of delay; at 65, it drops to 3 percent per year, up from only 1 percent prior to 1982. All future benefits are adjusted by this rate, so its magnitude is of considerable importance.

Employer pensions are more difficult to summarize because there are so many, each with its own rules. The most common criteria for calculating benefits, however, are years of service or average earnings over some time period--often the last few years an individual worked. In this research, we assumed that the years of service factor dominated, so that an additional year of work would increase the annual benefit by 1/n where n is the number of years with the firm. For those eligible for reduced but not full benefits, we also added an actuarial adjustment based on an industry-wide average.[7]

These changes in pension and Social Security wealth depend on whether or not one works an additional year and are, therefore, best viewed as a component of compensation. If during the year an employee earns $20,000 and accrues an additional $5000 in pension wealth, the true compensation is $25,000. Similarly, if retirement income wealth decreases by $5000, because future increases do not fully compensate for benefits foregone, the true net pay is only $15,000. As we document below, many older workers do suffer pension wealth losses with continued work. This is a surrepitious pay cut--the "carrot"--which induces but does not force retirement.

We define this change in retirement income wealth during an incremental year of work as

(2) $$DELTA = W(1) - W(0) - C(0)$$

where W(0) is the present discounted value of a retirement stream claimed at t=0,

W(1) is the value if claimed at t=1, after another year of work,[8] and

C(0) is the employee's contribution to the retirement plan made during the incremental year.[9]

A positive DELTA implies an increase in wealth (and true compensation that is higher than the paycheck); a negative DELTA implies a wealth loss.

Table 5 displays pension and Social Security DELTA values for our sample of full-time employed men, aged 63 to 65 in 1974, using a 5 percent discount rate for

Table 5: Pension and Social Security DELTAs, Full-Time Employed Men Aged 63 to 65 in 1974. (Discount Rate = 5%)

PENSIONS

Age	-5000+	-3000 to -5000	-1000 to -3000	-1 to -1000	0	1 to 1000	1000 to 2000	Median[a]
63	2	2	7	20	43	22	3	-$ 149
64	1	4	26	19	46	4	0	-$1156
65	6	8	27	11	47	1	0	-$2062

SOCIAL SECURITY

Age	-3000 to -6000	-1500 to -3000	-1 to -1500	0	1500 to 1	3000 to 1500	6000 to 3000	Median[a]
63	0	0	12	6	29	51	3	+$1852
64	0	1	16	3	45	34	1	+$ 857
65	48	43	3	6	1	0	0	-$3044

[a]Median of those with non-zero DELTA

Source: Retirement History Study

exposition.[10] For pensions, the 63 year olds are almost evenly split between positive and negative values, with a median, therefore, near 0. Those aged 64 and 65, however, are more likely to lose than to gain. By age 65, the median is loss over $2000 (1974 dollars), with 10 percent of the sample (and 19 percent of those with pensions) losing over $4000.

Social Security DELTAs change even more dramatically.[11] At 63 and 64, the median respondent gains Social Security wealth. This is due to the benefit calculation formula, and the additional adjustment of 7 percent per year, which is approximately actuarially fair.[12] At 65, however, the adjustment dropped to 1 percent, meaning that benefits foregone were basically lost forever. Practically all the respondents would lose Social Security wealth if they continued to work, and the median respondent would lose over $3000.

Whether these wealth changes are considered large or small depends on what they are being compared to. A logical candidate is conventionally-defined before-tax earnings. In Table 6, we show the ratio of earnings including wealth changes to regular earnings, disaggregated by pension coverage. The median ratios tell the story. At age 63 and 64, the Social Security gains dominate the pension losses, and the median ratio exceeds 1.00. But at 65, the story is reversed, and the median values suggest large pay cuts--about one-third for those without and nearly one-half for

Table 6: Ratio of Net Earnings to Earnings, by Age and Pension Status (Net Earnings Net of Social Security and Pension DELTAs)

Age	.70 and less	.70 - .90	.90 - 1.00	1.00 - 1.10	1.10 - 1.20	1.20 - 1.30	1.30+	Median Ratio
			RESPONDENTS WITHOUT PENSIONS					
63	0	3	17	23	24	23	11	1.13
64	6	4	18	22	32	10	8	1.10
65	74	17	9	0	0	0	0	.65
			RESPONDENTS WITH PENSIONS					
63	6	1	18	18	34	17	7	1.12
64	15	18	22	19	22	4	0	0.97
65	92	6	2	0	0	0	0	0.52

Source: Retirement History Study

those with pensions. These estimates are rough, because they ignore tax effects and assume that all the full time employees who continue to work lose all their Social Security benefits. Nonetheless, they suggest that these wealth change effects are potentially very large.

Behind these medians, of course, stand entire distributions. Even among those aged 63, for example, 20 percent of those without and 25 percent of those with pensions lose retirement income wealth with continued work. These incentives may be important retirement determinants for these respondents even if their magnitudes are small at the median.

The mere existence of the carrot does not make it important. People must understand and respond to these incentives for them to have an impact. Whether people do understand and respond is an empirical question that we have investigated.

Our approach is to observe the actual labor force transition behavior of our sample of workers approaching normal retirement age. We first analyzed the retirement behavior of the subsample aged 63 to 65 who were employed in 1973 and <u>did not</u> face mandatory retirement by 1975. These are employees who are free to choose whether or not to continue work. What factors seem to influence that choice?

Our labor supply model (detailed in Burkhauser and Quinn [1983c]) contained health, demographic and financial variables, including earnings potential, pension and Social

Security wealth, and pension and Social Security DELTAs. We hypothesized that retirement would be discouraged by high potential earnings and DELTAs (the hidden component of compensation) and encouraged by health deterioration during the transition period and by large pension and Social Security wealth.

Logit estimates of the retirement equation coefficients, which appear in Table 7, generally confirm our hypotheses. Health deterioration, full-time earnings, and the DELTAs are significant explanatory variables.[13] Ceteris paribus, those who will lose retirement income wealth by continuing to work are more likely to retire. Pension wealth is also a significant variable, although Social Security wealth, surprisingly, is not.[14] Marital status and mandatory retirement in the future (after 1975) do not appear to be important.

Older workers behave as though they understand the financial incentives to retire. Since these incentives often become effective simultaneously with mandatory retirement, it is important to disaggregate their effects. Failure to do so will overstate the impact of either the carrot or the stick.

Table 8 shows the actual retirement behavior of our sample of initially employed workers. Of those not facing mandatory retirement by 1975, 41 percent were out of the labor force by then. Of those facing the constraint, 83 percent had left--a large potential mandatory retirement

Table 7

Job Exit Equations for Men Aged 62-64
Dependent Variable = 1, if respondent leaves his 1973 job by 1975

	Logit Results	
Explanatory Variables	B	t
Constant	-.169	.58
Health deterioration '73-75	.300	1.68*
Mandatory retirement after '75	-.087	0.43
Married	.303	1.23
Earnings last year	-.042	2.53*
Social Security DELTA	-.112	2.83*
Pension DELTA	-.221	2.67*
Social Security WEALTH	.029	0.52
Pension WEALTH	.125	1.79*
F test	.040**	

*Significant at 5 percent level (one-tailed test).

**Likelihood ratio index.

effect of over 40 points.[15] But these subsamples differ by more than mandatory retirement status. In particular, those facing mandatory retirement are much more likely to have pensions and, at this age, negative DELTAs (potential wealth losses). To deduce the separate impact of this age constraint, we first predict how those who were subject to it would have behaved if they had not faced mandatory retirement, but did face the other incentives (that is, did have all their other explanatory variables). We do so by running the mandatory retirement subset through our prediction equation (Table 7), and calculating their hypothetical behavior. If we predict that, for example, 43 percent would have left the labor force, close to the 41 percent observed for those unconstrained, then our retirement incentive analysis has accomplished little, and the potential mandatory retirement effect (from 43 to 83) remains large. On the other hand, should the predicted retirement rate be near the 83 percent actually observed for this subgroup, then there is no need to refer to mandatory retirement to explain the differences--the other variables are responsible. When this hypothetical calculation is made, the predicted retirement rate for those who actually faced mandatory retirement is 63 percent (see Table 8). Slightly over half of the actual differential, then, is due to other determinants--the work disincentives built into our retirement income plans. The remaining half (from 63 to 83) is an upper bound estimate of the mandatory retirement effect.[16]

Table 8:- Percent Out of the Labor Force by 1975, Men employed and Aged 62 to 64 in 1973

Not Subject to Mandatory Retirement: Actual	4[illegible]
(Subject to Mandatory Retirement: Predicted)	(63)
Subject to Mandatory Retirement: Actual	83

Source: Actual values based on Retirement History Study. Predicted value based on Logit Equation in Table 6.

V. POLICY IMPLICATIONS

Our research suggests that the extension of the mandatory retirement age will not greatly affect work effort at older ages. To reverse the trend away from work and the long run dangers it causes the Social Security system, more fundamental change in retirement policy must be considered. There are strong financial incentives to retire built into pension and Social Security programs, and employees respond to them. We argue that these incentives have more to do with decreased work than does mandatory retirement.

To date primary federal policy effort to influence retirement age has been to delay the minimum age of mandatory retirement to age 70. As a rough estimate of the impact of this change, we asked what would have happened to our age cohort (men 62 to 64) had this change been in effect in 1973. We added the maximum mandatory retirement effect (20 percentage points from Table 7) to the participation rate of those subject to the constraint, and then extrapolated the results from our sample to the population. Our point estimate is that fewer than 50,000 more men aged 64 to 66 would have been in the labor force in 1975. (See Burkhauser and Quinn [1983c].) This is about a 6 percent increase in the number of employed men aged 64 to 66. It raises the labor force participation rate of this age group by only 2 percentage points, and is inconsequential when compared to the size of the aggregate labor force. The total effect is small because many employees do not even

face mandatory retirement, because many who do face it retire before that age, and because those who do retire at that age are also being influenced by other factors.

The eventual impact of this change in the law remains to be seen. Though deprived of the stick, employers retain the carrot. If firms are able to alter pension structures to impose even larger wealth losses on those who continue to work at older ages, the long-run effects of the change in mandatory retirement will be even smaller than the short-run effects we have estimated. Under current interpretations of the ADEA, actuarially unfair pension plans are not considered discriminatory. But the Select Committee on Aging (U.S. House of Representatives) is now considering a change in the law to force firms to provide more neutral pension choices.

There is little doubt that the work incentives in Social Security and pension plans have altered the work effort of older Americans. As we approach the end of this century, the costs of this policy in lost manpower will grow. The changing demographic structure makes it clear that policies that drive older men and women away from productive work must be changed. The 1977 ADEA Amendment delaying mandatory retirement is the first and easiest political response to the problem. But we are convinced that more fundamental changes in the incentive structures of our retirement income plans is needed before the work effort of older citizens is increased.

Definitions of Variables and Mean Values

Variable	Definition	Mean Value
Health deterioration	"How would you say your health today compares with your own health two years ago? Is it better, worse, or the same?" (Worse=1)	.25
Mandatory Retirement after 1975	Mandatory Retirement some time after the transition period (1973-1975)	.22
Married	(Yes = 1)	.87
Earnings last year	(Thousands of dollars)	8.78
Social Security DELTA	See text (thousands of dollars, at 5% discount rate)	.19
Pension DELTA	See text (thousands of dollars, at 10% discount rate)	.46
Social Security WEALTH	See text (ten-thousands of dollars, at 5% discount rate)	4.66
Pension WEALTH	See text (ten-thousands of dollars, at 10% discount rate)	0.86

FOOTNOTES

[1]Some analysts prefer a combined youth and old age dependency ratio--the ratio of those less than 18 and over 64 to those 18 to 64. As Clark [1980] points out, the declining youth dependency ratio largely offsets the increasing old age trend, with the net result depending on fertility and immigration assumptions. In any case, the youth issue is of little direct applicability to the Social Security system.

[2]Yearly Social Security benefits are based on the Social Security earnings record of a worker who had median earnings in each year of his worklife and who retired, on January 1 of the relevant year, at age 65 together with his non-working 65 year old wife. Increases in nominal benefits are the result of increases in nominal wages over the period and increases in the Social Security benefit formula. The real benefits are deflated to 1967 dollars.

[3]Two groups were given permanent exemptions from the amendment--high paid business executives in policy making positions (who are defined in terms of the duties they perform and the pension benefits for which they are eligible) and certain occupations in which job performance is clearly related to age (like pilots and firemen). A temporary exemption was given for tenured university and college faculty, but that expired in 1982.

[4]The proportion is higher for men (46 percent) than for the non-married women (34 percent). The Retirement History

Study, the data source for these statistics and for this paper, did not contain married women as respondents, although some information on the spouses of male respondents is provided.

[5]In a life cycle model with perfect information and capital markets, there is no necessary connection between the age of eligibility and the age of retirement. Lifetime wealth (including retirement income wealth) determines the allocation of time between work and leisure, and lending or borrowing equilibriates consumption and income streams. If information is imperfect, however, and employees do not know the wealth value until eligible, or if capital markets prevent consumption of pension wealth before receipt, an eligibility variable may capture these effects.

[6]Nearly all pensions require that one leave the job to collect benefits. Those who stay on the job must delay receipt. The Social Security rules do not require any such withdrawal, but rather reduce benefits by 50 percent of any earnings over an exempt amount. In this paper, we assume that full time work completely eliminates one's Social Security benefit. To the extent that this is untrue (which it may be for certain low income earners), our methodology exaggerates the wealth loss.

[7]These assumptions are spelled out in detail in an appendix to Burkhauser and Quinn [1983b].

[8]We assumed that respondents would earn as much in this incremental year as they did the past year during which they

were employed full time. On the basis of this, annual benefits were adjusted (using the 1/n rule and actuarial adjustment for pensions, and the actual benefit calculation rules for Social Security), and new wealth values calculated. We experimented with three different discount rates; 2, 5, and 10 percent.

[9]Only the employee's contribution was included for Social Security. For employer pensions, we assumed that the fund was financed entirely by the employer (C(0) = 0) as is usually the case.

[10]We observe these workers employed in 1973, and then observe them again in 1975. We assume that they remain employed until 1974 and then make the choice we observe in 1975. The DELTAs are, therefore, calculated for workers aged 64 to 66 in 1974.

[11]We assumed that employer pensions involve no spouses' or survivors' benefits. This is not true for Social Security. Our Social Security wealth values include spouses' benefits, where applicable, and the probability of the spouse surviving the husband and collecting benefits on her own, at two-thirds the combined rate. The latter requires knowing the age of the spouse, which we do.

[12]A pension is actuarially fair if future increments to benefits due to additional work just offset the current benefits foregone. In such a case, the change in wealth is zero, and only the first affect on retirement behavior (the wealth effect) would exist. Our point in this section is

that most retirement income plans eventually turn actuarially unfair, resulting in an implicit pay cut. This is the work disincentive we are discussing.

An interesting implication of this is that the earnings test does not really exist if benefits lost (taxed away by the 50% benefit reduction rate) are repaid later with actuarially fair "interest." Although the earnings test appears on the books at age 62, it is really not an important issue until age 65, when the adjustment factor drops.

[13]When wealth and DELTA variables are excluded from the equation, a simple pension eligibility dummy is significant. When these more sophisticated concepts are included, the dummy becomes insignificant, and has been excluded in Table 7.

[14]Weak wealth effects are frequently found in the labor supply literature. One explanation is that the coefficients may be picking up two offsetting effects--the normal wealth impact (encouraging retirement) and the effect of an unmeasured personality characteristic--proclivity for work. The latter, positively correlated with current wealth because of hard-working behavior in the past, is also associated with delayed retirement in the present.

[15]The majority of these 17 percent still at work have taken new jobs. A few, however, are still found to be employed on the old job--an apparent contradiction. These may be data errors, cases where special exceptions to the rule were made, or situations where the mandatory retirement

takes place at the end of the calendar year in which the worker turns 65, not on his 65th birthday.

[16]We are implicitly assuming that retirement age preferences are uncorrelated with mandatory retirement status. A likely scenario, however, is that those who wish to work beyond 65 will be overrepresented in jobs without mandatory retirement. Similarly, those planning to retire before mandatory retirement anyway will not find the constraint a serious drawback and be overrepresented on such jobs. Eliminating mandatory retirement for these workers would then result in a smaller impact than the behavior of the workers without mandatory retirement would suggest. If this self-selectivity occurs, then our estimates exaggerate the impact of mandatory retirement, which we already find to be small.

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